A 25-mile radius radar used to alert surface-to-air missiles and anti-aircraft guns.

U.S. Air Force (Scott Stewart)

The New Joint Warfare

By FREDERICK R. STRAIN

Successfully developing effective military capabilities is not unlike solving Rubik's Cube. If individual service assets and strengths are represented by the squares of a cube, then solving the puzzle involves long periods of adjusting military capabilities to reach the optimum configuration. In the wake of the Gulf War many believe that the Armed Forces resemble a completed puzzle, one that took decades to solve but that now fits together as tightly as the classic paradigm of a cube. What actually occurred was that the puzzle was overtaken by technological breakthroughs and the rush of world events. The result is the advent of the kind of turmoil that disrupts the established order and presents the military professional with yet another puzzle to solve.

F–117A stealth aircraft on the flight line at Langley Air Force Base, Virginia.

U.S. Air Force

Summary

The Gulf War not only marked a watershed in modern joint and combined operations, but also ushered in another, new type of warfare that is influenced by the course of emerging technology and the pace of world events. Like changes that have followed the development of new weapons throughout military history, doctrine and strategy are undergoing a revolution in the wake of the greatly enhanced stealth, precision, and lethality of fielded systems. As a result, commanders can anticipate that operations will almost always be joint, that distinctions between the strategic and tactical levels will blur, that new centers of gravity will emerge, and that the combat area will be more complex and difficult to delineate. These changes require redefining campaigns and campaign phasing, interdiction, maneuver, close air support, and other time-honored terms.

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There have been other occasions in military history when one puzzle was supplanted by another, particularly as the result of technological developments.[1] The introduction of the machine gun, tank, airplane, submarine, atomic bomb, and ICBM all caused the Armed Forces to readjust their doctrine to meet fresh challenges. More recent innovations brought about stealth, precision, lethality, and surveillance systems that portend other revolutionary changes in military capabilities.

The United States decided to actively pursue particular technologies over the last twenty-five years to provide the Armed Forces with distinct military advantages. Even though the services worked to bring about this dramatic shift in the puzzle, many appear surprised by the outcome. This situation highlights the need to develop new doctrines and strategies that fully recognize and support the spectacular changes that have occurred. The services must dedicate themselves to solving the puzzle. We must also determine if the puzzle is still a cube or whether it has taken on another form better suited to the new environment. What are the changes in the paradigm?

Future Operations Will Be Joint

Military history is replete with accounts of campaigns and battles involving participation by only one service. In the new paradigm it is difficult to envision any point on the conflict spectrum where a single service would be committed alone. In the new joint warfare it is very likely that

- naval armadas will do battle on the high seas together with long-range bombers armed with Harpoon missiles
- operations against enemy land forces will involve sea-launched or air-launched, stand-off specialized anti-armor munitions as well as more conventional artillery
- air battles will involve theater ballistic missile defense systems launched by land forces or from off the decks of specialized naval vessels as well as the commitment of aircraft
- even relatively small, covert special operations will involve space-based communications and be supported by sea or air insertion and recovery of mission personnel.

The first postulate of the new warfare is that the services fight and operate jointly. Even lesser contingencies in the future will almost always involve materiel, C[4]I, or transport from more than one service. Military professionals must learn to appreciate emerging service capabilities and organize, train, and equip to optimize the employment of decisive joint force.

Strategy and Tactics

Distinctions between the strategic and the tactical levels of war are no longer clear. Nowhere is this lack of clarity more pronounced than in designating weapon systems. Long-range bombers destroy ground forces along the forward line of troops as short-range fighters attack and destroy oil refineries. Army helicopters hit strategic air defense control centers as Navy cruise missiles designed for fighting nuclear wars disable electrical grids with specialized payloads. Those who remain prone to "old think" fail to recognize how technology now enables *all* combat systems and elements to become strategic or tactical depending on their intended objective.

The distinction between strategic and tactical targets is also undergoing change. Influenced by waning doctrine associated with the Single Integrated Operational Plan (SIOP) and Cold War, military planners have lost track of the fact that the distinction relates to a target's impact on the CINC's objective rather than to the nature of the target itself. Thus communication nets, fielded forces, oil refineries, and vehicles have a strategic or tactical implication depending on the desired outcome.

New Centers of Gravity

The principle of attacking key centers of gravity (COGs) to quickly achieve an objective is as old as war itself and is taught at each level of Professional Military Education. Unfortunately, traditional COGs may have little impact on the outcome of future conflicts. Global economic and informational interdependencies, for example, suggest new centers of gravity that strategists must consider. These COGs require the military to develop and exploit new ways to attack key points. Destroying or interdicting an en-

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emy's economic infrastructure by computer intrusion may be just as valid as an approach to warfare by the year 2000 as strategic bombing is today.

Redefining the Combat Edge

Technology remains the major driving force behind the changing limits of the combat area. When soldiers lined up abreast and maneuvered with spears and shields in sweeping formations to flank an opponent, commanders needed only to primarily consider the breadth of battle. With the advent of artillery, the depth of the battle area (even on the seas) became an important consideration in the development of doctrine, strategy, and tactics. Fewer than twenty years after the first flight of the Wright brothers, the battle area had a significant, expanded vertical dimension. Most professionals recognize current technology is once again dramatically expanding the range of these boundaries. The breadth, depth, and height of the battle area now encompasses the entire globe and extends well into space. The requirement for global situational awareness is more critical than ever before.

The new paradigm points to revolutionary change in the way we think about the battle area. Time—the fourth dimension—may become the paramount factor in modern combat. Prior to the new warfare military leaders measured time (in combat terms) by weeks, months, or even years of operations. The luxury of having the time to think, plan, and react stemmed from the limitations on physical movement of combat forces. It took time for soldiers to march, vessels to transit, and aircraft to deploy, as well as for commanders to gather and assess intelligence.

the need to identify, target, and attack in near real-time is now a fact of life

Ballistic missiles, jet aircraft, hovercraft, and turbocharged light vehicles are characteristic of the new environment. As emphasized in *Joint Warfare of the U.S. Armed Forces* (Joint Pub 1), "Crises may unfold rapidly, and critical engagements may occur with little time to prepare." The commander can no longer afford the luxury of thinking in terms of days, weeks, or months to *phase* campaigns or move forces. The need to identify, target, and attack in near real-time is now a fact of life. Modern warfare demands grasping massive theater-scale operations on a minute-by-minute basis. The possibility of a potential adversary launching ballistic missiles compresses the decision cycle even further and dramatically emphasizes the point.

U.S. Navy

A Marine Corps F–18 fighter firing a Sidewinder missile.

Aside from the characteristics of new weapon systems, two additional factors influence the criticality of time in the new paradigm. The growing sensitivity of the American public to combat losses suggests that civilian leaders will tend to measure future acceptable levels of U.S. casualties in *dozens* rather than *thousands* of lives. The Gulf War set a standard in this regard that could be difficult to meet in future conflicts unless certain technological advantages are pursued. In order to minimize casualties, the Armed Forces must deliver the full range of combat power quickly and decisively. Moreover, prolonged conflicts make it far more difficult to maintain political-military coalitions which are becoming increasingly important and complex in the new environment.

The New Battle Area

The ability to conduct simultaneous operations across the depth, breadth, and height of the combat area compels military professionals to change their perspective. The traditional reliance on finely drawn lines on charts must be challenged in order to fully realize the potential of emerging combat systems. Among the questions that must be asked are:

- Will future naval commanders responsible for destroyers with cruise missiles capable of striking ground targets a thousand miles away understand the new battle area? Will the missiles recognize Forward Support Control Lines (FSCLs) drawn on a chart or the significant maneuver by friendly forces that has occurred since launch? If not, how can combat power at the disposal of commanders be effectively advocated and integrated into useful operations?
- Will Army company commanders in charge of new fire systems with ranges of 200 km fully understand the integration of weapon systems into strategic targeting plans? If not, how can commanders begin to think about improving doctrine, strategy, and tactics?

Joint Combat Camera Center

Refueling M–1 Abrams tank during Operation Desert Shield.

Joint Combat Camera Center

Marines unloading a Landing Craft Air Cushion (LCAC–22) in Somalia.

New capabilities may not be able to operate within the confines of old doctrinal patterns if there is a true desire to optimize utility and exploit synergy. Joint Force Commanders (JFCs) will need new ways in the future to *undelineate* the battlefield and more effectively integrate and control service capabilities. Creative doctrines and strategies must emerge, and the vision of commanders must begin to be expanded at all levels.

Old Definitions/New Paradigm

Part of the inability of the services to fully participate in creative discussions about the new joint warfare is the inability to break with definitions belonging to the old model. Hidebound ideas that link certain terminology, weaponry, and/or services inhibit desperately needed innovation.

Campaigns and campaign phasing. Historically the term *campaign* meant a series of military operations directed by a commander in chief to achieve specific objectives. The campaign is composed of phases that match particular elements of combat power against sub-objectives. Each phase establishes the requisite environment or conditions for the next operation. Developing campaign plans designed to "peel the onion" layer by layer to get to the center of gravity is old thinking. That syndrome often crops up in doctrinal debates and is rooted in the mistaken notion that war continues to resemble giant Napoleonic battles of yore. It envisions masses of Americans fighting masses of enemy troops in bloody combat, battling their way to the enemy's capital in order to eventually convince their leaders that further resistance is futile.

The new paradigm suggests that simultaneity or what some theorists call simultaneous or parallel warfare (as opposed to serial warfare) is key to future operations. Old-style serial warfare is illustrated by the way air forces struck targets during World War II when commanders massed hundreds of bombers and dropped thousands of bombs against a single important target. The next day they did the same thing against a second target; and on the third day yet another target was hit. It did not take long before the enemy realized that on the following day a fourth target would be struck. By the tenth day the first target was repaired and operational again. Serial warfare on land, at sea, and in the air was necessary to achieve the mass needed to destroy a particular target.

The Gulf War demonstrated it is now possible to simultaneously strike hundreds of key targets through the careful integration of land, sea, and air capabilities. The result is the strategic, operational, and tactical paralysis of an enemy in a brief period of time: that ability to bring down the hammer in one gigantic crushing blow is the new joint warfare. In this respect using the term *campaign* to denote carefully sequenced activities

U.S. Navy (Kit Masterson)

Combat information center aboard the aircraft carrier *USS Constellation.*

over a prolonged period of time may no longer be valid. The advent of parallel warfare dramatically reduces the time required to achieve objectives. The net result is that future JFCs can pursue multiple objectives simultaneously. For all practical purposes transitions between campaign phases may occur so quickly that one might consider each campaign as consisting of only a single phase. If so, are there still traditional campaigns or should a new term be coined and added to the military lexicon?

Interdiction. Impeding, hindering, or isolating by firepower (typically using short-range aviation or submarines) is the traditional form of interdiction. This old definition, however, is no longer sufficient for the new joint warfare and changing battle environment. Service capabilities now provide for interdiction by computer, electronic warfare, electromagnetic pulse, psychological operations, and a host of other emerging means of denial.

Furthermore, planners have historically viewed interdiction as a function that supports the CINC. But consider the emerging paradigm: could not technology provide interdiction capabilities so complete and effective (read *operationally paralyzing*) that an opponent recognizes the futility of continuing? That was hardly the case in World War II, Korea, or even Vietnam. The high volume of munitions required to strike individual targets—due to weapon inaccuracy—could not support effective, wide-scale interdiction.[2] If it is now becoming possible to achieve operational paralysis quickly, then interdiction could conceivably become the JFC's primary strategy.

There is also a danger in believing that interdiction is more effective if segmented or divided into geographic regions or areas of responsibility.[3] Interdiction must occur quickly and decisively across the depth, breadth, and height of the modern battle area to fully exploit its synergistic effect. This means controlling interdiction at command levels responsible for theater-wide activities. Allowing control of interdiction activities to reside at a lower echelon of command—or excluding certain capabilities because of service-unique positions—will likely result in missed opportunities and the misuse of integrated land, sea, air, space, and special operations forces.

interdiction must occur quickly and decisively across the battle area

Maneuver. A principle of war generally associated with mass movement, maneuver may become less important in the new battle area. First, being able to see the entire battle area (using JSTARS, AWACS, and emerging space systems) provides JFCs with opportunities to optimize movement. Commanders will move smaller and smaller elements of very lethal systems to counter

larger, less capable enemy forces. This will avoid wasted movement of excess force and thereby negate the need for increasingly complex logistical support. The intricate challenge of keeping fuel flowing to speeding heavy vehicles for the ground assault during Operation Desert Storm, for example, portends the problems traditional weapon systems have in the new battle area.

Second, events in the modern battle area could happen so quickly there will be scant time to react, let alone to plan and execute mass maneuver. The battle area of the future will be the domain of lighter, faster, more lethal land, sea, and air vehicles. The expanded nature of the combat area almost precludes moving traditional systems far enough and quickly enough to keep pace with the tempo of widely-dispersed geographic operations. A major challenge to future JFCs is the ability to provide real-time command and control for small, combined elements of extremely lethal forces moving throughout the battle area at breakneck speed. The famous left hook during Desert Storm (involving almost 50,000 vehicles) may have been the last major large-scale maneuver of its kind.

no single weapon or force reaches its full potential unless employed with complementary capabilities

Finally, developing long-range ground and naval fires and exploiting air-launched stand-off weapons could diminish the need to maneuver for close-in engagements as enemy ground, naval, and air forces are destroyed at greater and greater distances. Assuming strong defensive positions—as more advanced semi-autonomous weapons systems begin to dot the battle area—could be the most advantageous tactic of the future.

Maneuver in the new joint warfare focuses on maneuvering technological strengths against an adversary's weaknesses to minimize casualties and shorten the conflict. The speed, precision, and increased lethality of emerging weapons will allow commanders the opportunity to concentrate on maneuvering smaller and smaller forces: single ships instead of armadas, companies in place of battalions, and one stealth air vehicle instead of dozens of traditional aircraft.

Fire Support Control Lines (FSCLs). As mentioned previously, the notion of two dimensional lines on charts as absolute delineators of responsibility has to be revised. Traditional means of command and control cannot keep abreast with the rapid pace of operations in the new joint warfare. As attention focuses on the development and employment of smaller, lighter, faster, but more lethal weapon systems, JFCs must conceive new methods of deconflicting ground, naval, and air forces. Since the only common point of reference available to all types of forces is time (provided by synchronized space satellites), the new boundaries, perhaps drawn in time, will serve as the dividing lines of the future. Centralized command and control of targeting under the Joint Force Air Component Commander (JFACC) is only the first step in a process that must exploit new technologies. Eventually communication and computer systems should automatically deconflict combined fires and optimize target-attack sequences by sending signals across the battle area that inhibit or enable weapon systems based upon real-time feedback.

Close Air Support. Another term of art that requires revision as technology changes the battle area is Close Air Support (CAS) which traditionally meant aircraft attacking enemy ground forces in close proximity to friendly troops. The support involved both preplanned and immediate requirements, yet recently the focus tends to be almost exclusively on the immediate. An aircraft has even been designed exclusively to perform this mission. With the development of improved guidance and fire control systems, support to forces engaged close-in can be accomplished just as easily with new forms of artillery, both air- and surface-launched stand-off weapons that disperse cluster and anti-armor munitions, and emerging nonlethal technologies.

Once again each of the services can contribute to these requirements in the new battle area. The true key to success in future joint warfare is to provide forces with sufficient indigenous lethality so that immediate CAS is rarely needed. The generic term used for such support should be simply *close support* which more accurately reflects the changing nature of weapon systems that

conceivably could deliver munitions or other payloads from land, sea, or air.

These are just a few of the terms and definitions that must be recast in light of the new joint warfare. They also reveal some of the basic elements of this warfare.

Fundamentals of the New Warfare

The first basic element of the new warfare is the axiom that the whole is greater than the sum of its parts. While technology can provide unprecedented military capabilities, no single weapon or force reaches its full potential unless employed with complementary capabilities. The military professional should recognize the increasing *synergism* of modern forces. In particular, Joint Force Commanders (JFCs) must be cognizant of individual service capabilities and enabling characteristics needed to carefully orchestrate quick, decisive actions. The ability to *orchestrate* force capabilities to achieve desired results is the key to success. It does not matter if a symphony conductor once played the flute; the only allegiance is to the strength and power of the synergism.

Complementary operations are necessary for any future success. JFCs must form the team so that the appropriate players are in the line-up and ensure the game plan suits the operation. In the new paradigm, it is important that JFCs select the *key force* required to spearhead efforts. That force is the military capability with the greatest potential impact on events. This concept goes well beyond designating a particular service as the key force. In the new warfare special forces or psychological operations may have as much impact on the outcome as traditional combat elements. The key force requires full and unequivocal support from all force elements. The force designated by JFCs may vary in each new scenario.

claiming service-unique doctrinal exemptions is counterproductive to the new joint warfare

Another element of new doctrinal development is *organizing to win*. Relationships that exist only in crises have proven to be less and less effective over time. Command relationships of the past cannot be relied on to continue to work in the future. It is necessary to pioneer new command structures for peacetime as well as periods of crisis.

Conflict has achieved truly *global proportions*. It is difficult to envision any scenario affecting only the United States. Because of American troop withdrawals from around the world, conflicts will be fought at greater distances than in the past. This fact requires close cooperation with allied and friendly nations for the use of sovereign airspace, transit of waterways, and benefit of temporary basing facilities. Practically all military scenarios envision political support of allies and other international partners. Greater participation by coalitions in conflicts and operations can be expected. This puts greater emphasis on the expanding role of combined training and exercises. Not only must joint doctrine be capable of accommodating new technology and exploiting service capabilities, but it must be intelligible to both allies and coalition partners. Absent from the current debate are serious questions about improving combined operations. How would Thai forces use U.S. space assets during coalition action? How would U.S. forces exploit future Japanese assets? These are important issues for the new joint warfare.

Post-conflict operations in the new joint warfare environment are almost as important as combat itself. Protecting refugees, fostering fledgling regimes, providing humanitarian assistance, and enforcing peace accords are all necessary to ensure stability in today's world.

The Challenge for Commanders

Effective command and control of the most capable military force in history is a daunting task. Not only must JFCs completely understand the synergetic effect of an increasing range of service capabilities, but designated commanders must be enabling forces themselves. JFCs must have authority to direct all available assets at their disposal and the ability to create cohesive teams. Any attempt to undermine or dilute the principle of unity of command by claiming service-unique doctrinal exemptions is counterproductive to the new joint warfare.

Future battle within the new paradigm is more than a team effort. Most team members tend to come together and put aside their individual differences only for the big game, then they part company and revive personal animosities. Resulting friction on the sidelines eventually manifests itself on

the field, thereby denigrating the entire team's effectiveness. The challenge is to develop a force that respects the strengths of all its components and appreciates the judgment of its JFC.

The delegation of authority is one of the cornerstones of modern warfare. While it may seem at odds with the principle of unity of command, it really is an indication of the level of trust and confidence that JFCs place in the ability of their subordinate commanders to accomplish objectives.

The selection of the key force for a particular operation gets increasingly difficult, but it is nonetheless important. Decisions regarding the key force will affect many factors in the new environment. It determines reaction time, how much and what type of force to unleash, the degree of lethality to apply, how fast an adversary can be defeated, the kind of targets to attack, and the level of casualties that can be sustained. More importantly, when JFCs select the principal combat capability they determine which force will receive the priority allocation of resources.

U.S. Army (Samuel D. Henry)

Hawk missile system on an XM501 E–3 loader transporter.

The command relationships evolving from designation of the key force have come to be known as the *supported* and the *supporting* forces. The new joint warfare recognizes that these designations are not indicators of popularity. No negative connotations attach to being designated a supporting force in given operations. The supported commander must be generally able to direct the key force enabled by the complementary capabilities of other components. Such command relationships vary from one scenario to another, and even within particular operations.

Targeting in the new paradigm also deserves a fresh look. Traditional methods of selecting and attacking targets may not be effective in the emerging technological environment. The requirement to identify, target, and destroy mobile missile launchers in Operation Desert Storm suggests the kind of challenge that JFCs will face in the future. Moreover, the significance of a given target vis-á-vis the objective must be better understood. For example, destroying an industrial target as part of an effort to achieve strategic paralysis may severely affect the ability of an enemy to recover economically in the postwar period (which could have significant political implications).

Expanded intelligence gathering and analysis are critical to an economy of effort. Disabling attacks on targets, identified through careful nodal analysis, can enhance operations by strategically and operationally paralyzing an enemy. With fewer resources JFCs must be able to strike hard and fast at the correct targets, with little waste of effort. Advance analyses of key political, economic, military, and infrastructure targets are critical to reacting quickly and decisively. Furthermore, the rapid pace of modern joint operations requires the targeting cycle to have near real-time capability, with the added requirement that target data be disseminated in a form common to all forces.

Success in the new joint warfare requires each team member to recognize significant shifts in technology, appreciate the synergism of capabilities, and develop innovative doctrine and strategy to take advantage of these conditions. Undoubtedly there will be challenges that confront JFCs in the new joint warfare. But force integration is not an issue to take up on the eve of battle. It must be realized prior to a crisis by developing and adopting common joint doctrine, and also by appreciating the effort involved in once again solving the puzzle of Rubick's Cube. **JFQ**

NOTES

[1] See Anthony H. Cordesman, *Compensating for Smaller Forces: Adjusting Ways and Means Through Technology* (Carlisle Barracks, Pennsylvania: U.S. Army War College, 1992).

[2] In World War II it took 9,070 bombs dropped by an armada of B–17s to ensure a 90 percent probability of kill (PK) against a single 60-foot by 100-foot building. By the time of the Vietnam conflict, 176 bombs were required. Today it takes only one precision guided bomb to achieve the same PK. (Data courtesy of the Strategic Planning Division, Headquarters, U.S. Air Force.)

[3] For a discussion of the historical lessons learned, see Wesley Frank Craven and James Lee Cate, editors, *The Army Air Forces in World War II*, Volume 2, *Europe: Torch to Pointblank, August 1942 to December 1943* (Chicago: University of Chicago Press, 1949), p. 28 ff.